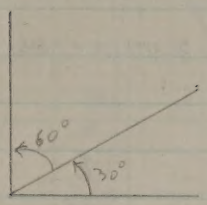
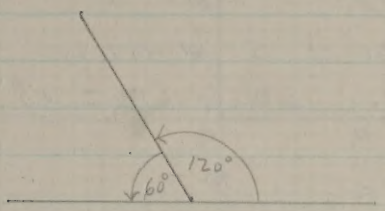
AGUSTIN LUCAS
COOK'S MATH ASSIG.

PROBL. 1-8. CHAPT XXII - 1

1

a) 

b) 

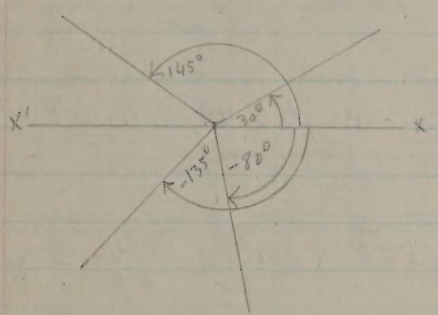
2 a) 45° b) $90^\circ - 32^\circ = 58^\circ$ c) $90^\circ - 85^\circ = 5^\circ$ d) $90^\circ - 98^\circ = -8^\circ$

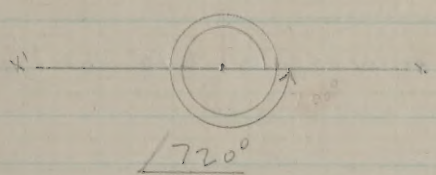
e) $90^\circ - 135^\circ = -45^\circ$ f) $90 - (-60^\circ) = 150^\circ$

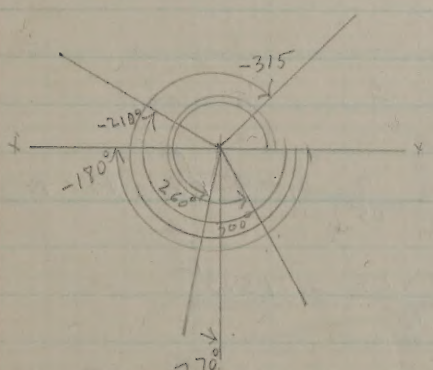
3 a) $180^\circ - 45^\circ = 135^\circ$ b) $180^\circ - 94^\circ = 86^\circ$ c) $180^\circ - 120^\circ = 60^\circ$

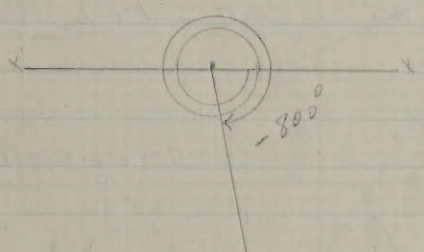
d) $180^\circ - 210^\circ = -30^\circ$ e) $180^\circ - 300^\circ = -120^\circ$ f) $180^\circ - (-85^\circ) = 265^\circ$

4









5 11

6 $360 \div 60 = 6 \quad 6 \times 5 = 30^\circ$

1 $360 \div 60 = 6^\circ$

2 $30^\circ = 5$ MINUTES, HOUR HAND MOVES 5 MINUTES OR 30° IN 1 HOUR
$\therefore 30^\circ \div 60 = .5^\circ$ PER MINUTE

PROBL. 1-5 CHAPT XXII - 2

1 a) 2π b) π c) $\frac{1}{3}\pi$ d) $\frac{1}{2}\pi$ e) $\frac{1}{8}\pi$ f) $\frac{1}{4}\pi$

g) $\frac{3}{4}\pi$ h) $1\frac{1}{2}\pi$ i) $1\frac{1}{3}\pi$ j) 4π k) $1\frac{3}{4}\pi$ l) $1\frac{2}{3}\pi$

2 a) $57.3^\circ \times 2 = 114.6^\circ$ b) $57.3^\circ \times .4 = 22.92^\circ$ c) $57.3^\circ \times .318 = 18.2^\circ$

d) $57.3^\circ \times .6 = 34.4^\circ$ e) $57.3^\circ \times 2.2 = 126.1^\circ$ f) $57.3^\circ \times .056 = 3.21^\circ$

3 $2\pi \cdot 3\frac{3}{4} =$ 23.58 RADIANS OR 7.50π RADIANS

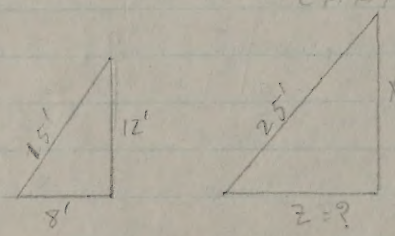
4 45 MINUTES = $270^\circ = 1\frac{1}{2}\pi$ RADIANS OR $1.5\pi = 4.08$ RADIANS

5 ANGULAR VELOCITY $= 2\pi F =$ $F = 1500$ RPM $= \frac{1500}{60} = 25$ R.P.S.

$2\pi 25 = 50\pi = 157$ RADIANS/SECOND.

ALL PROB. CHAPTER XXII - 3

1



IF $\frac{8}{15} = \frac{z}{25}$ $\therefore 8 \cdot 25 = 15 \cdot z =$

$= z = \frac{8 \times 25}{15} =$ 13.3'

IF $\frac{12}{15} = \frac{x}{25}$ $\therefore 12 \cdot 25 = x \cdot 15$

$x = \frac{12 \cdot 25}{15} =$ 20'

20 FT
13.3 FT

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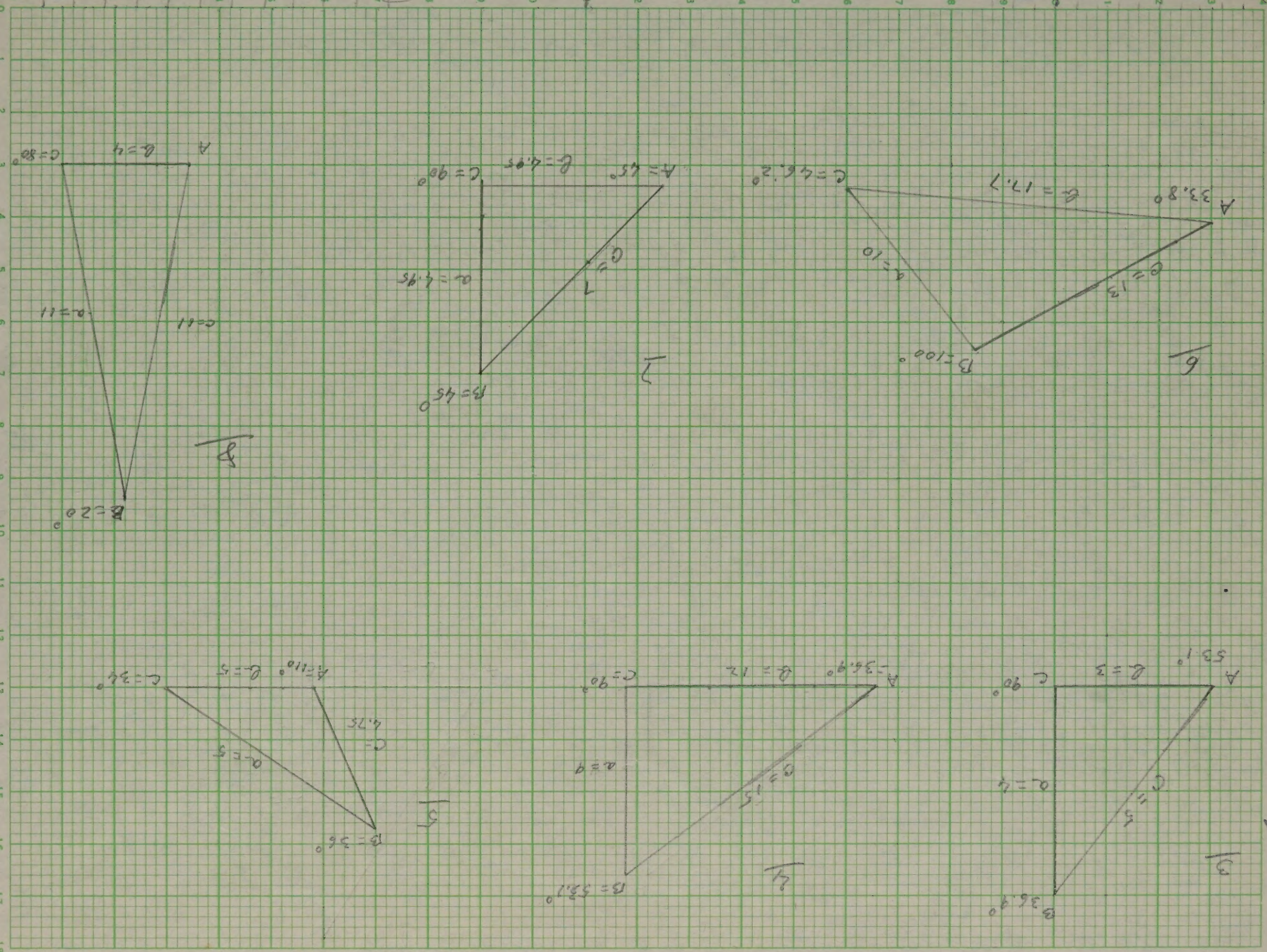

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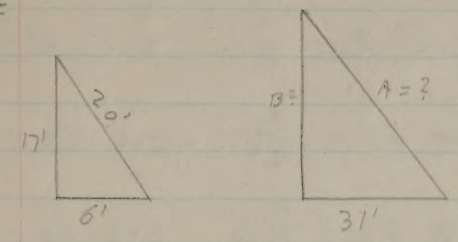
CONTINUED CHART- XXII – 3

2

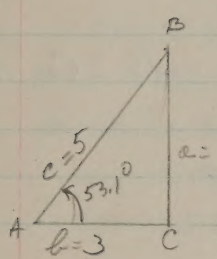


$\frac{6}{17} = \frac{31}{B}$ THEN $6 \cdot B = 31 \cdot 17 \therefore B = \frac{31 \cdot 17}{6} = 87.8$

IF $\frac{6}{20} = \frac{31}{A}$ THEN $6 \cdot A = 20 \cdot 31 \therefore A = \frac{20 \cdot 31}{6} = 103.3$

B = 87.8 FT.
A = 103.3 FT.

3



$\angle B = 90° - 53.1° = 36.9°$
$\angle C = 90°$
$a = 5^2 = 3^2 + a^2$; $a^2 = 5^2 - 3^2 = a = \sqrt{5^2 - 3^2} = 4$

4 -5- 6- 7 -8 DRAWN ON GRAPH PAPER

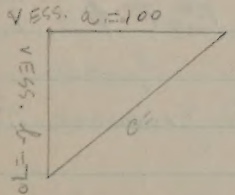
1 TO 5 CHART- ~~XXII~~ – 4

1 $c = \sqrt{20^2 + 15^2} = \sqrt{625} = \underline{25}$ $\measuredangle B = 90° - 36.9° = \underline{53.1°}$

2 $31 = \sqrt{b^2 + 13^2} = 31^2 = b^2 + 13^2 \therefore b^2 = 31^2 - 13^2 = b = \sqrt{31^2 - 13^2} = \underline{28.1}$
$\measuredangle B = 90° - 24.8° = \underline{65.2°}$

3 $165^2 = 105^2 + a^2 = a^2 = 165^2 - 105^2 = a = \sqrt{165^2 - 105^2} = \underline{127.}$
$\measuredangle A = 90° - 50.4° = \underline{39.6°}$

4



$a = 20 \times 5 = 100$ KNOTS
$b = 14 \times 5 = 70$ "
$c = \sqrt{100^2 + 70^2} = \underline{121.65 \text{ KNOTS}}$

5 $80 - 6 = 74'$ $\sqrt{74^2 + 50^2} = \underline{89.3 \text{ FT}}$

PROB. 1-6 CHAPT XXIII - 1

1. Tan $\theta = \frac{b}{a}$ Tan $B = \frac{a}{b}$ cot $\phi = \frac{a}{b}$ cot $B = \frac{b}{a}$

Sin $\theta = \frac{b}{c}$ sine $B = \frac{a}{c}$ cos $\phi = \frac{a}{c}$ cos $B = \frac{b}{c}$

sec $\phi = \frac{c}{a}$ sec $B = \frac{c}{b}$ csc $\phi = \frac{c}{b}$ csc $B = \frac{c}{a}$

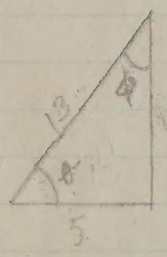
2. a. Sine $\alpha = \frac{RO}{RP}$, b) Sine $B = \frac{PO}{PR}$ c) Cot $B = \frac{OR}{OP}$ d) Tan $\alpha = \frac{OR}{OP}$

3. a) $\frac{OP}{OR}$ = Tan B or cot α b) $\frac{PR}{PO}$ = Csc B and Sec B.

c) $\frac{OR}{PR}$ = cos. B. Sin α d) $\frac{OP}{RP}$ = Sin B Cos α

e) $\frac{PR}{RO}$ = Sec B or Csc B.

4.



Tan $\theta = \frac{12}{13}$ Tan $\phi = \frac{5}{12}$ cot $\theta = \frac{5}{12}$ cot $\phi = \frac{12}{5}$

sin $\theta = \frac{12}{13}$ Sin $\phi = \frac{5}{13}$ cos $\theta = \frac{5}{13}$ cos. $\phi = \frac{12}{13}$

SEC θ $\frac{13}{5}$ Sec $\phi = \frac{13}{12}$ csc $\theta = \frac{12}{13}$ csc $\phi = \frac{13}{5}$

5. a) $X = \frac{1}{2}Z$ $Z = 1$ b) $X = R$ $\phi 45°$ d) $R = \frac{1}{2}X = .5$ θ 26.6°

$X = .333$. $R = .942$ TAN - 1 COS $\theta = .895$

SINE = .333 - SEC = 1.06, SIN = .7071

COS = .333 COS - .7071 $C = Z = 2R = \phi = 60°$

TAN = .354 TAN = 1.7321

COT = 2.83

CSC = 3

6. a) Sec $B = \frac{5}{3}$ b) Csc α $\frac{3}{1} = 3$ c) Cot $\phi = \frac{1}{1} = 1$

d) Cos θ $\frac{3}{4}$ e) Tan $B = \frac{11}{3}$ f) Sin = $\frac{1}{10}$

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Calculus Math 165.

ALL PR. CHAPT. XXIII - 2

1 a) II OR IV b) I OR II c) II OR IV d) I OR III

e) I OR IV f) II OR III g) II h) I i) III

j) II k) I OR II l) I OR III m) II OR III

2 a) 41° SIN = + b) 82° SIN = + c) 276° SIN = −
COS = + COS = + COS = +
TAN = + TAN = + TAN = −

d) 210° SIN = − e) 95° SIN = + f) 310° SIN = −
COS = − COS = − COS = +
TAN = + TAN = − TAN = −

g) -60° SIN = − h) -130° SINE = − i) -200° SINE = +
COS = + COS = − COS = −
TAN = − TAN = + TAN = −

j) $\frac{\pi}{4} = 45^\circ$ SINE = + k) $\frac{3\pi}{2} = 180^\circ$ (?) l) $\frac{-4\pi}{3} = -240^\circ$ SIN = +
COS = + COS = −
TAN = + TAN = −

2)

3 c) $\sqrt{2^2+3^2} = 3.6$

$\text{SINE} = \frac{3}{3.6}$

$\text{TAN} = \frac{3}{2}$

$\text{COS} = \frac{2}{3.6}$

$\text{COT} = \frac{2}{3}$

$\text{CSC} = \frac{3.6}{3}$

$\text{SEC} = \frac{3.6}{2}$

d) $r = \sqrt{(-12)^2+(-5)^2} = 12.96\ (13$

$\text{SINE}\phi = -\frac{5}{13}$

$\text{TAN}\phi = +\frac{5}{12}$

$\text{COS}\phi = -\frac{12}{13}$

$\text{COT}\phi = \frac{12}{5}$

$\text{CSC}\phi = -\frac{13}{5}$

$\text{SEC}\phi = -\frac{13}{12}$

e) $r = \sqrt{6^2+8^2} = 100$

$\tan\phi = \frac{4}{3}$ $\cot\phi = \frac{3}{4}$

$\sin\theta = \frac{4}{5}$ $\csc\phi = \frac{5}{4}$

$\cos\phi = \frac{3}{5}$ $\sec\phi = \frac{5}{3}$

f) $r = \sqrt{3^2+(-4)^2} = 5$

$\tan\phi = -\frac{4}{3}$ $\cot\phi = -\frac{3}{4}$

$\sin\phi = -\frac{4}{5}$ $\csc\phi = -\frac{5}{4}$

$\cos\phi = +\frac{3}{5}$ $\sec = +\frac{5}{3}$

g) $r\sqrt{-6^2-8^2} = 10$

$\tan = -\frac{4}{3}$ $\cot = +\frac{3}{4}$

$\sin = -\frac{4}{5}$ $\csc = -\frac{5}{4}$

$\cos = +\frac{3}{5}$ $\sec = +\frac{5}{3}$

h) $r = \sqrt{-9^2+-3^2} = 9.5$

$\tan = -\frac{1}{3}$ $\cot = +\frac{3}{1}$

$\sin = -\frac{3}{9.5}$ $\csc = -\frac{9.5}{3}$

$\cos = +\frac{9}{9.5}$ $\sec = +\frac{9.5}{9}$

i) $r = \sqrt{6^2+8^2} = 10$

$\tan = -\frac{4}{3}$ $\cot = -\frac{3}{4}$

$\sin = +\frac{4}{5}$ $\csc = +\frac{5}{4}$

$\cos = -\frac{3}{5}$ $\sec = -\frac{5}{3}$

j) $r = \sqrt{20^2+15^2} = 25$

$\tan = -\frac{3}{4}$ $\cot = -\frac{4}{3}$

$\sin = -\frac{3}{5}$ $\csc = -\frac{5}{3}$

$\cos = +\frac{4}{5}$ $\sec = +\frac{5}{4}$

k) $r = \sqrt{5^2+5^2} = 7.05$

$\tan = 1$ $\cot = 1$

$\sin = \frac{5}{7.06}$ $\csc = \frac{7.06}{5}$

$\cos = \frac{5}{7.06}$ $\sec = \frac{7.06}{5}$

ALL

CHART XXIV - 1

1 a) 13°

SIN = .2250

COS = .9744

TAN = .2309

b) 89°

SINE = .9998

COS = .0175

TAN = 57.9

c) 4.3°

SIN = .075

COS = .9972

TAN = .0752

d) 57.9°) SINE = .8471

COS = .5314

TAN = 1.5941

e) 25.4°) SINE = .4289

COS = .9033

TAN = .4748

f) 17°) SINE = .2924

COS = .9563

TAN = .3057

1 AND 2 · CHART XXIV - 3

1 a) $180° - 99 = 81°$
SINE = .9877
COS = -.1564
TAN = -6.3138

b) $180° - 164° = 16°$
SIN = .2756
COS = -.9613
TAN = -.2867

c) $180 - 136.5 = 43.5°$
SIN = .6884
COS = -.7254
TAN = -.9490

d) $180° - 159.1° = 21.9°$
SIN = .3730
COS = -.9278
TAN = -.4020

e) $180 - 178.1° = 1.9°$
SIN = .0332
COS = -.9995
TAN = -.0332

f) $180 - 103 = 73°$
SIN = .9563
COS = -.2924
TAN = -3.2703

g) $180 - 114.3 = 65.7°$
SIN = .9114
COS = -.4115
TAN = -2.2148

h) $180 - 146.8 = 33.2°$
SIN = .5476
COS = -.8368
TAN = -.6544

i) $180 - 261 = -81$
SINE = -.9877
COS = -.1564
TAN = +6.3138

j) $180 - 220.7 = -40.7°$
SIN = -.6526
COS = -.7581
TAN = +.8601

k) $180 - 197.4 = -17.4$
SIN = -.2990
COS = -.9542
TAN = +.3134

l) $180 - 233.9 = -53.9°$
SIN = -.8080
COS = -.5892
TAN = +1.3713

m) $360 - 352 = +8$
SIN = -.1392
COS = +.9903
TAN = -.1405

n) $360 - 277 = +83°$
SIN = -.9925
COS = +.1219
TAN = -8.1443

o) $360 - 347.1 = 11.9°$
SIN = -.2062
COS = +.9785
TAN = -.2107

p) $360 - 285.7 = 74.3°$
SIN = -.9627
COS = +.2706
TAN = -3.5576

q) $540 - 480 = 60$
SIN = -.8660
COS = -.5000
TAN = +1.7321

r) $720 - 667 = 53°$
SIN = -.7986
COS = +.6017
TAN = -1.3270

s) $900 - 847 = 53$
SIN = +.7986
COS = -.6018
TAN = -1.3270

t) $406 - 360 = -46°$
SIN = -.7193
COS = +.6947
TAN = -1.0392

u) $540 - 590 = -50°$
SIN = -.7660
COS = -.6428
TAN = +1.1918

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CONT. CHAPT XXII-1

f) 72° SINE = .9781 COS = .2079 TAN = 4.7046

i) 8.7° SINE = .1513 COS = .9885 TAN = .1530

i 63.1° SINE = .8918 COS = .4524 TAN = 1.9626

f 33.6° SINE = .5534 COS = .8329 TAN = .6644

2 a 25.75°
SINE = .4337 + .0007 = .4344
COS = .9011 − .0004 = .9007
TAN = .4813 + .0010 = .4823

b) 73.36°
SINE = .9578 + .0003 = .9581
COS = .2874 − .0010 = .2864
TAN = 3.3332 + .0127 = 3.3459

c 2.16°
SINE = .0366 + .0007 = .0373
COS = .9993 − — = .9993
TAN = .0367 + .0007 = .0374

d 47.72°
SINE = .7396 + .0002 = .7398
COS = .6730 − .0003 = .6727
TAN = 1.0990 + .0008 = .0998

e) 10.22°
SINE = .1771 + .0012 = .1783
COS = .9842 − .0002 = .9840
TAN = .1799 + .0013 = .1812

f 37.55°
SINE = .6088 + .0006 = .6094
COS = .7934 − .0006 = .7928
TAN = .7673 + .0014 = .7687

g) 69.93°
SINE = .9391 + .0002 = .9393
COS = .3437 − .0005 = .3432
TAN = 2.7326 + .0045 = 2.7371

h) 53.18°
SINE = .7997 + .0008 = .8005
COS = .6004 − .0011 = .5993
TAN = 1.3319 + .0038 = 1.3357

ALL CHAPT- XXIV -2

1 a) 3.6° b) 84.2° c) 15.3° d) 67.7° e) 37.1°

2 a) 87.7° b) 11.8° c) 55.5° d) 65.1° e) 37.7°

3 a) 7.9° b) 84.1° c) 36.1° d) 58.° e) 4.7°

4 a) 51.7° b) 74.1° c) 4.1° d) 51.3° e) 5.4°

Question three ✓

cont. CHAPT - XXIV - 3

v) $360 - 335 = -25°$
SIN = + .4226
COS = + .9063
TAN = + .4663

w) $360 - 292.4 = 67.6°$
SIN = − .9245
COS = + .3811
TAN = − 2.4262

x) $360 - 320.3 = 39.7°$
SIN = − .6387
COS = + .7694
TAN = − .8302

2 a) 21.3° b) −7.3° OR 352.7° c) 36.9° OR 323.1°

d) 97.4° e) 1.6° f) −54.9° OR 305.1°

g) 74.3° h) −24.5° OR 335.5°